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For: MULTIMEDIA MESSAGING SERVICE ARRANGEMENT AND METHOD

CLAIM FOR PRIORITY UNDER 35 USC § 119

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

April 5, 2004

Sir:

The benefit of the filing dates of the following prior foreign application(s) filed in the following foreign country(ies) is hereby requested for the above-identified patent application and the priority provided in 35 U.S.C. §119 is hereby claimed:

Finnish Patent Application No. 20031871 filed on December 19, 2003 in Finland

In support of this claim, certified copy(ies) of said original foreign application(s) is/are filed herewith.

It is requested that the file of this application be marked to indicate that the requirements of 35 U.S.C. §119 have been fulfilled and that the Patent and Trademark Office kindly acknowledge receipt of these/this document(s).

Please charge any fee deficiency or credit any overpayment with respect to this paper to Counsel's Deposit Account No. 50-2222.

Respectfully submitted,



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PRIORITY DOCUMENT

Hakija
Applicant

Nokia Corporation
Helsinki

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Patent application no

20031871

Tekemispäivä
Filing date

19.12.2003

Kansainvälinen luokka
International class

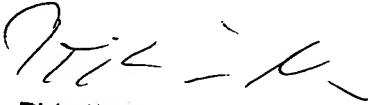
H04Q

Keksinnön nimitys
Title of invention

"Multimedia messaging service arrangement and method"
(Multimediasanomapalvelujärjestelmä ja menetelmä)

Täten todistetaan, että oheiset asiakirjat ovat tarkkoja jäljennöksiä Patentti- ja rekisterihallitukselle alkuaan annetuista selityksestä, patenttivaatimuksista, tiivistelmästä ja piirustuksista.

This is to certify that the annexed documents are true copies of the description, claims, abstract and drawings originally filed with the Finnish Patent Office.


Pirjo Kaila
Tutkimussihteeri

Maksu 50
Fee 50 EUR

Maksu perustuu kauppa- ja teollisuusministeriön antamaan asetukseen 1027/2001 Patentti- ja rekisterihallituksen maksullisista suoritteista muutoksineen.

The fee is based on the Decree with amendments of the Ministry of Trade and Industry No. 1027/2001 concerning the chargeable services of the National Board of Patents and Registration of Finland.

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MULTIMEDIA MESSAGING SERVICE ARRANGEMENT AND METHOD

FIELD OF THE INVENTION

The present invention relates to a multimedia messaging service in a telecommunications system.

5 BACKGROUND OF THE INVENTION

Multimedia Messaging Service (MMS) is a new kind of messaging service similar to Short Message Service (SMS) for the mobile environment, standardized by the Open Mobile Alliance (OMA, formerly known as the WAP Forum) and the 3rd Generation Partnership Program (3GPP). However, an
10 MMS message may include audio and video content in addition to conventional text content. MMS is bearer-independent, and therefore not limited to only e.g. GSM or WCDMA networks.

Figure 1 shows a reference architecture of Multimedia Messaging Service Environment (MMSE) as specified by the 3GPP. An essential element
15 of the MMS is a multimedia messaging service centre (MMSC). According to the reference architecture, the multimedia messaging service centre MMSC includes (either within MMSC or as external servers connected thereto either directly or through an IP network) an MMS Relay and a number of MMS servers. According to the established naming practice, server 0 is a message stor-
20 age server while other servers 1 to N provide other services, such as e-mail, telefax services etc. The MMS relay is connected to user databases such as an HLR (Home Location Register).

The MMSE provides the multimedia messaging services to user equipment, e.g. a mobile station, via one or more access networks to which the
25 user equipment (UE) is connected. An UE comprises or is connected to a MMS User Agent, which is an application layer function that provides the users with the ability to view, compose and handle multimedia messages (MM). In Figure 1 a first user equipment UE1 is connected to the MMSC through an access network A, which is the home network of UE1. Roaming user equipment
30 UE2 in turn is connected to the MMSC through a visited network B.

An MMS Value Added Service (VAS) Application, also shown in the architecture of Figure 1, offer value added services to MMS users via the MMS. There may be several MMS VAS applications included in or connected to an MMSE. The VAS applications can be connected to the MMSC either di-
35 rectly, as shown in Figure 1 or e.g. via an IP network. A value added service

generally refers to a telecommunication service by means of which the user is provided with a service outside the telecommunication network. Value added services include e.g. various information services, interactive gaming and personal multimedia communication services. Value added services could be provided either by the operator or a 3rd party.

BRIEF DESCRIPTION OF THE INVENTION

An object of the present invention is to provide an enhanced multimedia messaging service apparatus and method. The objects of the invention are achieved by a multimedia messaging service arrangement, a method, a telecommunications system element, a value added service providing element and a computer-readable storage medium comprising a computer program set, which are characterized by what is stated in the independent claims 1, 19, 37, 45 and 60. The preferred embodiments of the invention are disclosed in the dependent claims.

The invention is based on the realization that by providing a MMS VAS application with roaming information on a user equipment the roaming of the user equipment can be taken into account by the VAS providing system entity when providing a value added service to the user equipment. MMS VAS application generally refers to a system entity providing a value added service to a user of the user equipment via a multimedia messaging service in a multimedia messaging service system. The invention is further based on providing the VAS providing system entity with the roaming information on the user equipment by sending a message from a system entity, which provides the multimedia messaging service to the user equipment, to the VAS providing system entity which message comprises the roaming information on the user equipment.

An advantage of the arrangement and method of the invention is that it provides the VAS applications with a possibility to take into consideration the roaming information on the user equipment and to use the roaming information when providing a value added service to the user equipment e.g. by producing a value added service dependently or conditionally on the roaming information value. An indication of roaming can be very useful for external applications that are able to perform content adaptation: with knowledge the user equipment is roaming the content may be adapted e.g. such that the transfer time & hence costs incurred are lower. Furthermore, an indication of roaming

could also be used to perform specific actions, e.g. routing or forwarding the multimedia message in a roaming situation to another destination that provides a higher transfer bandwidth.

BRIEF DESCRIPTION OF THE DRAWINGS

5 In the following the invention will be described in greater detail by means of preferred embodiments with reference to the attached drawings, in which

 Figure 1 is a block diagram of a telecommunications system in which the invention can be used;

10 Figure 2 is a signalling diagram of an embodiment of the invention; and

 Figure 3 is a signalling diagram of an embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

 Figure 1 illustrates a block diagram of a telecommunications system in which the invention can be used. As already described earlier, the system of
15 Figure 1 is the reference architecture of multimedia messaging service environment (MMSE) as specified by the 3GPP. As to a more detailed functional description of the multimedia messaging service, reference is made to 3GPP Technical Specification 23.140 V6.3.0 (September, 2003): "3rd Generation
20 Partnership Project; Technical Specification Group Terminals; Multimedia Messaging Service (MMS); Functional description; Stage 2 (Release 6)". The use of the invention, however, is by no means limited to the system shown in Figure 1 but the invention can also be used in other kind of present and future multimedia messaging systems. It should also be noted that Figure 1 illustrates
25 only elements that are necessary for the understanding of the invention. Also the terminology used should be interpreted broadly and understood as descriptive and not limiting.

 The system of Figure 1 comprises a multimedia messaging service centre (MMSC), which typically includes (either within MMSC or as external
30 servers connected thereto either directly or through an IP network) an MMS Relay and a number of MMS servers. The functions of the MMS relay and MMS server(s) may also be combined within the multimedia messaging service centre such that they do not appear as separate entities. It should be noted that the multimedia messaging service environment might comprise
35 more than one multimedia messaging service centres, which may be used in a

clustered manner. This, however, has no relevance to the basic idea of the invention. The MMS relay is connected to user databases such as an HLR (Home Location Register). The MMSE provides the multimedia messaging services to user equipment UE1 and UE2, e.g. a mobile station or a fixed network terminal, via one or more access networks AN1 and AN2 to which the user equipment (UE) is connected. The access networks AN1 and AN2 can be e.g. second generation mobile networks, such as GSM or CDMA networks, and/or third generation mobile networks, such as UMTS networks. The access networks AN1 and AN2 can also include other cellular networks, fixed networks and IP networks. An UE comprises or is connected to a MMS User Agent, which is an application layer function that provides the users (not shown separately) with the ability to view, compose and handle multimedia messages (MM). In Figure 1 a first user equipment UE1 is connected to the MMSC through an access network A (AN1), which is the home network of UE1. Roaming user equipment UE2 in turn is connected to the MMSC through a visited network B (AN2). Furthermore, Figure 1 shows an MMS Value Added Service (VAS) Application 10, which offer value added services to MMS users via the MMS. Value added services could be provided either by the operator or a 3rd party. There may be one or several MMS VAS applications 10 included in or connected to an MMSE. The VAS applications 10 can be connected to the MMSC either directly, as shown in Figure 1 or e.g. via an IP network. The VAS applications may be physically located in a special server element or some other network element, for example. This, however, has no relevance to the basic idea of the invention. According to 3GPP specifications the reference point (or interface) between the MMSC and a MMS VAS Application 10 is MM7.

According to the invention a MMS VAS application 10, i.e. a system entity providing a value added service to a user of a user equipment UE1 or UE2 via the multimedia messaging service, is provided with roaming information on the user equipment UE1 or UE2 by sending a message 100 from a system entity, which provides the multimedia messaging service to the user equipment, to the VAS providing system entity which message comprises the roaming information on the user equipment. In the exemplary system of Figure 1 the system entity, which provides the multimedia messaging service to the user equipment UE1 or UE2, is the MMSC. Figure 2 illustrates a signalling diagram in which the MMSC sends a message 100 to the VAS application. The

message 100, which is used for conveying the roaming information, is preferably an existing MM7 message, such as an MM7 delivery request message (MM7_deliver.REQ) or an MM7 delivery report request message (MM7_delivery_report.REQ), into which the required information is added.

- 5 However, also a specific dedicated message could be used for conveying the roaming information. The roaming information preferably comprises a roaming status, which indicates if the user equipment UE1 or UE2 is roaming outside a home network of the user equipment i.e. is roaming in a visited network. According to an embodiment of the invention, additional/alternative information
- 10 such as an address of a switching centre, which the user equipment is using, may be included in the roaming information conveyed in the message 100. The switching centre generally refers to e.g. a mobile switching centre MSC (not shown in the figures), which is a mobile network element performing the switching functions in its area of operation and controlling the interworking with
- 15 other networks. The user equipment is typically connected to a mobile switching centre via a base station system (not shown in the figures), which provides an air interface for the user equipment.

The message 100, which is used for conveying the roaming information, preferably comprises a special roaming status element. For example,

20 the XML (eXtensible Markup Language) Schema code of MM7 delivery request message as found in 3GPP Technical Specification 23.140 V6.3.0 is as follows:

```

25 <xs:complexType name="deliverReqType">
    <xs:complexContent>
        <xs:extension base="tns:genericRSReqType">
            <xs:sequence>
                <xs:element name="LinkedID"
type="tns:messageIDType" minOccurs="0"/>
30 <xs:element name="Sender"
type="tns:addressType"/>
                <xs:element name="Recipients"
type="tns:recipientsType" minOccurs="0"/>
                <xs:element name="PreviouslySentby"
35 type="tns:previouslySentByType" minOccurs="0"/>

```



```

        <xs:element
name="PreviouslySentDateAndTime"    type="tns:previouslySentByDateTime"
minOccurs="0"/>
        <xs:element                name="SenderSPI"
5   type="tns:serviceProviderIDType" minOccurs="0"/>
        <xs:element                name="RecipientSPI"
   type="tns:serviceProviderIDType" minOccurs="0"/>
        <xs:element                name="TimeStamp"
   type="xs:dateTime" minOccurs="0"/>
10   <xs:element                name="ReplyChargingID"
   type="tns:messageIDType" minOccurs="0"/>
        <xs:element                name="Priority"
   type="tns:priorityType" minOccurs="0"/>
        <xs:element                name="Subject"
15  type="xs:string" minOccurs="0"/>
        <xs:element                name="Content"
   type="tns:contentReferenceType" minOccurs="0"/>
        </xs:sequence>
        </xs:extension>
20   </xs:complexContent>
</xs:complexType>

```

As an example, the invention can be implemented by modifying this Schema to add the following roaming elements (or only one of them): a boolean flag indicating the roaming state (true or false) and the actual roaming MSC Address. An example of the possible modifications is shown below:

```

<xs:element name="RoamingStatus">
    <xs:complexType>
30   <xs:attribute name="Roaming" type="xs:boolean" use="optional"
   default="false"/>
        <xs:attribute name="MSCAddress" type="xs:string" use="optional"
   />
        </xs:complexType>
35 </xs:element>

```

Both items (the flag and the address) are preferably optional. In this case the MMSC preferably decides when to use the roaming status indication and/or address information. This can be implemented e.g. such that a special pre-condition is set in the MMSC and when this pre-condition is met, the MMSC inserts the roaming information in the message 100 (or sends the message 100 if a dedicated message is used for this purpose). Such a pre-condition may be, for example, the country code of the MSC address of the user equipment; if the country code is different than that of the home operator of the user equipment, then the MSC address is not local to the operator and, consequently, the user equipment is roaming. It is also possible that the VAS application 10 asks for the roaming information. This embodiment is useful e.g. in a situation where the VAS application provides e.g. a push service to the user equipment. Push service refers to a telecommunication service by means of which a user equipment user is sent information, such as daily news, without a separate request for a single transmission. In other words, the transmission of one or more multimedia messages containing the information relating to the push service is initiated by the VAS application. In this situation, it is preferable that the VAS application on its own initiative asks for the roaming information before the transmission, since the roaming information possibly contained in the VAS application might be outdated.

The roaming information of the user equipment is typically readily available in the MMSC. In particular, in a mobile terminated message case the MMSC will typically request/perform a number lookup for user B. This is done via an IMSI (International Mobile Subscriber Identity) request to the HLR and this, as a side effect, will also return the current MSC address of where the user equipment is. From this kind of location information the MMSC knows if the user equipment is roaming and can determine and insert the corresponding roaming information, e.g. the roaming status indication and/or the address information (which in turn may comprise the complete address of the switching centre, which the user equipment is using, or just a country code of the network, which the user equipment is using, for example) to the message 100 to the VAS application. The HLR may alternatively upon request provide the MMSC with other information on the location of the user equipment such as a VLR (Visitor Location Register) address where the subscriber is located. The VLR address according to e.g. E.164 addressing standard is a globally unique number and comprises a country code, which can be used to identify in what

country the user is located. From this the MMSC can then determine and insert the corresponding roaming information to the message 100 to the VAS application. It is also possible that the MMSC determines the roaming information differently or from a different network element than the HLR without that this
5 has any relevance to the basic idea of the invention.

According to further embodiments of the invention, the roaming of the user equipment is taken into account by the VAS application and the roaming status information is used when providing a value added service to the user equipment e.g. by producing a value added service dependently (i.e. how the
10 service is produced) or conditionally (i.e. is the service produced or not) on the roaming information value. It should be noted that numerous other ways of using the roaming information in the VAS application may exist in addition to those presented in the following and the invention is not limited to only these examples. According to an embodiment of the invention, the VAS application
15 adapts content of one or more multimedia messages to be delivered to the user equipment in response to an indication that the user equipment is roaming. Such one or more multimedia messages to be delivered to the user equipment may be originally generated by the VAS application. Alternatively, one or more multimedia messages to be delivered to the user equipment may
20 be generated by some other entity such that the VAS application merely performs e.g. the possible content adaptation for multimedia messages that are delivered to the user equipment through the VAS application. The content adaptation may include, for example, reducing the size of the content, which is transferred to the user equipment, such that the transfer time and hence costs
25 incurred are lower or decrypting an encrypted content if the user equipment is roaming in an area where encrypted messages are not allowed. The content adaptation may also include adding an operator logo or an advertisement to the message. In this case the operator may decide use a local pricing tariff for messages delivered to roaming user equipment and then gain revenue by adding
30 advertisements or other information to these messages.

As an example, let's assume that UE1 in Figure 1 is local in a home network AN1 and UE2 is also a customer of network AN1 but is currently roaming in a foreign network AN2.

1) UE1 sends a multimedia message that has DRM (Digital Rights
35 Management, which is a rights management system, which ensures that content can only be used when the relevant conditions, determined by the copy-

right owner, have been met) applied to it and encryption is not allowed in the particular foreign network AN2. In this case, when the message arrives to the home operator's MMSC, the message must be sent to UE2 in plain text. This kind of decryption can be performed in the VAS application 10.

5 2) UE1 sends a message with a large message size to UE2. Here the transfer from UE1 via the VAS application 10 to UE2 can reduce the size of the message e.g. by replacing a complex image in the message with a thumb-nail thereof. As a result, UE2 will not have to pay so much to retrieve the mes-

10 Figure 3 shows a general signaling diagram of the above content adaptation examples where the VAS application 10 performs filtering service (i.e. in these examples encryption removal or message size reduction). First UE1 sends 301 the multimedia message to the MMSC. Then the MMSC sends 302 the multimedia message and the roaming information to the VAS applica-
15 tion e.g. in a MM7 delivery request message as described above. The VAS application 10 adapts 303 the content of the multimedia message and sends 304 it back to the MMSC. The MMSC notifies 305 UE2 and UE2 retrieves 306 and receives 307 the adapted multimedia message.

 According to yet another embodiment of the invention, the VAS ap-
20 plication 10 selects a route or a destination of one or more multimedia mes-
sages to be delivered to the user of the user equipment on the basis of the roaming status of the user equipment. For example, if the user equipment is roaming, the VAS application can direct a multimedia message, which is deliv-
25 ered through the VAS application or which is produced by the VAS application, to the user equipment via an alternative route or to another destination that provides a higher transfer bandwidth (e.g. Internet via a fixed line) and from where the user of the user equipment can get it (e.g. to an e-mailbox of the user). According to an embodiment of the invention, the VAS application may defer the delivery of a multimedia message to the user equipment until a later
30 time if the user equipment is roaming or decide not to deliver the multimedia message at all.

 The VAS application 10 can also provide the user equipment with information on the basis of the roaming information. According to an embodi-
35 ment of the invention, the VAS application determines a location of the user equipment on the basis of the address of the switching centre which the user equipment is using and provide the user equipment with information relating to

the determined location. The information relating to the location may be e.g. local news. In a similar manner, a multimedia message may comprise charging information indicating e.g. which party is expected to be charged for e.g. a multimedia message submitted by the VAS application or for a reply message thereto. This kind of charging information may indicate, for example, that the service is free of charge to the user of the user equipment. This charging information may then be set by the VAS application depending on the roaming information.

It will be obvious to a person skilled in the art that, as the technology advances, the inventive concept can be implemented in various ways. The invention and its embodiments are not limited to the examples described above but may vary within the scope of the claims.

CLAIMS

1. A multimedia messaging service arrangement in a telecommunications system, the arrangement comprising:

5 a first system entity (MMSC) providing a multimedia messaging service to a user equipment (UE1, UE2) connected to a network (AN1, AN2) of the system; and

a second system entity (10) providing a value added service to a user of the user equipment via the multimedia messaging service, **characterized** in that

10 the first system entity (MMSC) is configured to send a message (100, 302) to the second system entity (10) which message comprises roaming information on the user equipment (UE1, UE2).

2. An arrangement according to claim 1, **characterized** in that the roaming information comprises a roaming status indicating if the user equipment (UE1, UE2) is roaming outside a home network of the user equipment.

3. An arrangement according to claim 1 or 2, **characterized** in that the roaming information further comprises an address of a switching centre which the user equipment (UE1, UE2) is using.

20 4. An arrangement according to claim 1, 2 or 3, **characterized** in that the second system entity (10) is configured to use the roaming information when providing a value added service to the user equipment (UE1, UE2).

25 5. An arrangement according to claim 4, **characterized** in that the second system entity (10) is configured to adapt, on the basis of the roaming information, content of one or more multimedia messages to be delivered to the user equipment.

30 6. An arrangement according to claim 5, **characterized** in that the second system entity (10) is configured to encrypt or decrypt at least part of the content of one or more multimedia messages to be delivered to the user equipment on the basis of the roaming information.

7. An arrangement according to claim 6, **characterized** in that the second system entity (10) is configured to perform the encryption or decryption by using digital rights management.

35 8. An arrangement according to claim 4, **characterized** in

that the second system entity (10) is configured to determine, on the basis of the roaming information, whether a value added service can be provided to the user equipment.

5 9. An arrangement according to claim 4, **characterized** in that the second system entity (10) is configured to select a route or a destination of one or more multimedia messages to be delivered to the user of the user equipment (UE1, UE2) on the basis of the roaming information.

10 10. An arrangement according to claims 3 and 4, **characterized** in that the second system entity (10) is configured to determine a location of the user equipment (UE1, UE2) on the basis of the address of the switching centre which the user equipment is using and provide the user equipment with information relating to the determined location.

15 11. An arrangement according to claim 4, **characterized** in that the second system entity (10) is configured to determine charging related information on the basis of the roaming information and to add the charging related information to one or more multimedia messages to be delivered to the user equipment.

20 12. An arrangement according to any one of claims 1 to 11, **characterized** in that the first system entity (MMSC) is configured to send the message comprising the roaming information on the user equipment (UE1, UE2) to the second system entity (10) in response to a request received from the second system entity (10).

25 13. An arrangement according to any one of claims 1 to 12, **characterized** in that the first system entity (MMSC) is configured to obtain information on the location of the user equipment (UE1, UE2) from another system entity and to determine the roaming information on the user equipment (UE1, UE2) on the basis of the obtained location information before sending the message comprising the roaming information on the user equipment (UE1, UE2) to the second system entity (10).

30 14. An arrangement according to any one of claims 1 to 13, **characterized** in that the message (100, 302) comprising the roaming information on the user equipment (UE1, UE2) is an MM7 interface message.

35 15. An arrangement according to claim 14, **characterized** in that the message (100, 302) comprising the roaming information on the user equipment (UE1, UE2) is an MM7 delivery request message or an MM7 delivery report request message.

16. An arrangement according to any one of claims 1 to 15, **characterized** in that the first system entity (MMSC) is a multimedia messaging service centre.

5 17. An arrangement according to any one of claims 1 to 16, **characterized** in that the second system entity (10) comprises a multimedia messaging service value added service application.

18. An arrangement according to any one of claims 1 to 17, **characterized** in that the user equipment (UE1, UE2) is a mobile station.

10 19. A method for providing a multimedia messaging service in a telecommunications system comprising a first system entity providing multimedia messaging service to a user equipment connected to a network of the system and a second system entity providing a value added service to a user of the user equipment via the multimedia messaging service, **character-**
15 **ized** in that the method comprises a step of:

sending a message from the first system entity to the second system entity which message comprises roaming information on the user equipment.

20 20. A method according to claim 19, **characterized** in that the roaming information comprises a roaming status indicating if the user equipment is roaming outside a home network of the user equipment.

21. A method according to claim 19 or 20, **characterized** in that the roaming information further comprises an address of a switching centre which the user equipment is using.

25 22. A method according to claim 19, 20 or 21, **characterized** in that the method further comprises the step of using the roaming information when providing a value added service to the user equipment.

30 23. A method according to claim 22, **characterized** in that the method further comprises the step of adapting in the second system entity, on the basis of the roaming information, content of one or more multimedia messages to be delivered to the user equipment.

35 24. A method according to claim 22, **characterized** in that the method further comprises the step of encrypting or decrypting at least part of the content of one or more multimedia messages to be delivered to the user equipment on the basis of the roaming information.

25. A method according to claim 24, **characterized** in that

the encryption or decryption is performed by using digital rights management.

26. A method according to claim 22, **characterized** in that the method further comprises the step of determining, on the basis of the roaming information, whether a value added service can be provided to the user equipment.

27. A method according to claim 22, **characterized** in that the method further comprises the step of selecting in the second system entity a route or a destination of one or more multimedia messages to be delivered to the user of the user equipment on the basis of the roaming information.

28. A method according to claim 21 and 22, **characterized** in that the method further comprises the steps of determining in the second system entity a location of the user equipment on the basis of the address of the switching centre which the user equipment is using and providing the user equipment with information relating to the determined location.

29. A method according to claim 22, **characterized** in that the method further comprises the steps of determining charging related information on the basis of the roaming information and adding the charging related information to one or more multimedia messages to be delivered to the user equipment.

30. A method according to any one of claims 19 to 29, **characterized** in that the message, which comprises the roaming information on the user equipment, is sent from the first system entity to the second system entity in response to a request received in the first system entity from the second system entity.

31. A method according to any one of claims 19 to 30, **characterized** in that the method further comprises the steps of obtaining information on the location of the user equipment from another system entity than the first system entity and determining the roaming information on the user equipment (UE1, UE2) on the basis of the obtained location information before sending the message comprising the roaming information on the user equipment from the first system entity to the second system entity.

32. A method according to any one of claims 19 to 31, **characterized** in that the message comprising the roaming information on the user equipment is an MM7 interface message.

33. A method according to claim 32, **characterized** in that the message comprising the roaming information on the user equipment is an

MM7 delivery request message or an MM7 delivery report request message.

34. A method according to any one of claims 19 to 33, **characterized** in that the first system entity is a multimedia messaging service centre.

5 35. A method according to any one of claims 19 to 34, **characterized** in that the second system entity comprises a multimedia messaging service value added service application.

36. A method according to any one of claims 19 to 35, **characterized** in that the user equipment is a mobile station.

10 37. A telecommunications system element for providing multimedia messaging service to a user equipment (UE1, UE2) connected to a network (AN1, AN2) of the system, **characterized** in that

the system element (MMSC) is configured to send a message (100, 302) to a system entity (10) providing a value added service to a user of the user equipment (UE1, UE2) via the multimedia messaging service which message comprises roaming information on the user equipment.

15 38. A telecommunications system element according to claim 37, **characterized** in that the roaming information comprises a roaming status indicating if the user equipment (UE1, UE2) is roaming outside a home network of the user equipment.

20 39. A telecommunications system element according to claim 37 or 38, **characterized** in that the roaming information further comprises an address of a switching centre which the user equipment (UE1, UE2) is using.

25 40. A telecommunications system element according to claim 37, 38 or 39, **characterized** in that the system element (MMSC) is configured to send the message (100, 302) comprising the roaming information on the user equipment (UE1, UE2) to the system entity (10) providing the value added service in response to a request received from the system entity (10) providing the value added service.

30 41. A telecommunications system element according to any one of claims 37 to 40, **characterized** in that the system element (MMSC) is configured to obtain information on the location of the user equipment (UE1, UE2) from another system element and to determine the roaming information on the user equipment (UE1, UE2) on the basis of the obtained location information before sending the message comprising the roaming information on the user equipment (UE1, UE2) to the system entity (10) providing the value added

35

service.

42. A telecommunications system element according to any one of claims 37 to 41, **characterized** in that the message (100, 302) comprising the roaming information on the user equipment (UE1, UE2) is an MM7 interface message.

43. A telecommunications system element according to claim 42, **characterized** in that the message (100, 302) comprising the roaming information on the user equipment (UE1, UE2) is an MM7 delivery request message or an MM7 delivery report request message.

44. A telecommunications system element according to any one of claims 37 to 43, **characterized** in that the system element is a multimedia messaging service centre.

45. A value added service providing element configured to be connected to a telecommunications system for providing a value added service to a user of a user equipment (UE1, UE2) connected to a network (AN1, AN2) of the telecommunications system via a multimedia messaging service, which is provided by a multimedia messaging service providing system entity (MMSC), **characterized** in that

the value added service providing element (10) is configured to receive from the multimedia messaging service providing system entity (MMSC) a message (100, 302) which message comprises roaming information on the user equipment (UE1, UE2).

46. A value added service providing element according to claim 45, **characterized** in that the roaming information comprises a roaming status indicating if the user equipment (UE1, UE2) is roaming outside a home network of the user equipment.

47. A value added service providing element according to claim 45 or 46, **characterized** in that the roaming information further comprises an address of a switching centre which the user equipment (UE1, UE2) is using.

48. A value added service providing element according to claim 45, 46 or 47, **characterized** in that the element (10) is configured to use the roaming information when providing a value added service to the user equipment (UE1, UE2).

49. A value added service providing element according to claim 48, **characterized** in that the element (10) is configured to adapt, on the

basis of the roaming information, content of one or more multimedia messages to be delivered to the user equipment.

50. A value added service providing element according to claim 49, **characterized** in that the element (10) is configured to encrypt or decrypt at least part of the content of one or more multimedia messages to be delivered to the user equipment on the basis of the roaming information.

51. A value added service providing element according to claim 50, **characterized** in that the element (10) is configured to perform the encryption or decryption by using digital rights management.

52. A value added service providing element according to claim 48, **characterized** in that the element (10) is configured to determine, on the basis of the roaming information, whether a value added service can be provided to the user equipment.

53. A value added service providing element according to claim 48, **characterized** in that the element (10) is configured to select a route or a destination of one or more multimedia messages to be delivered to the user of the user equipment (UE1, UE2) on the basis of the roaming information.

54. A value added service providing element according to claims 47 and 48, **characterized** in that the element (10) is configured to determine a location of the user equipment (UE1, UE2) on the basis of the address of the switching centre which the user equipment is using and provide the user equipment with information relating to the determined location.

55. A value added service providing element according to claim 48, **characterized** in that the element (10) is configured to determine charging related information on the basis of the roaming information and to add the charging related information to one or more multimedia messages to be delivered to the user equipment.

56. A value added service providing element according to any one of claims 45 to 55, **characterized** in that the element (10) is configured to request for the roaming information on the user equipment (UE1, UE2) from the multimedia messaging service providing system entity (MMSC).

57. A value added service providing element according to any one of claims 45 to 56, **characterized** in that the message (100, 302) comprising the roaming information on the user equipment (UE1, UE2) is an MM7 interface message.

58. A value added service providing element according to claim 57,

characterized in that the message (100, 302) comprising the roaming information on the user equipment (UE1, UE2) is an MM7 delivery request message or an MM7 delivery report request message.

- 5 59. A value added service providing element according to any one of claims 45 to 58, **characterized** in that the element (10) comprises a multimedia messaging service value added service application.

- 10 60. A computer-readable storage medium comprising a computer program set, wherein the execution of the program set in a computer connected to a telecommunications system causes the computer to provide a value added service to a user of a user equipment (UE1, UE2) connected to a network (AN1, AN2) of the telecommunications system via a multimedia messaging service, which is provided by a multimedia messaging service providing system entity (MMSC), **characterized** in that

- 15 the execution of the program set in the computer further causes the computer to receive from the multimedia messaging service providing system entity (MMSC) a message (100, 302) which message comprises roaming information on the user equipment (UE1, UE2).

ABSTRACT

A multimedia messaging service arrangement and a method in a telecommunications system, the arrangement comprising a first system entity (MMSC) providing a multimedia messaging service to a user equipment (UE1, UE2) connected to a network (AN1, AN2) of the system and a second system entity (10) providing a value added service to a user of the user equipment via the multimedia messaging service, wherein the first system entity (MMSC) is configured to send a message to the second system entity (10) which message comprises roaming information on the user equipment (UE1, UE2).

10 (Figure 1)

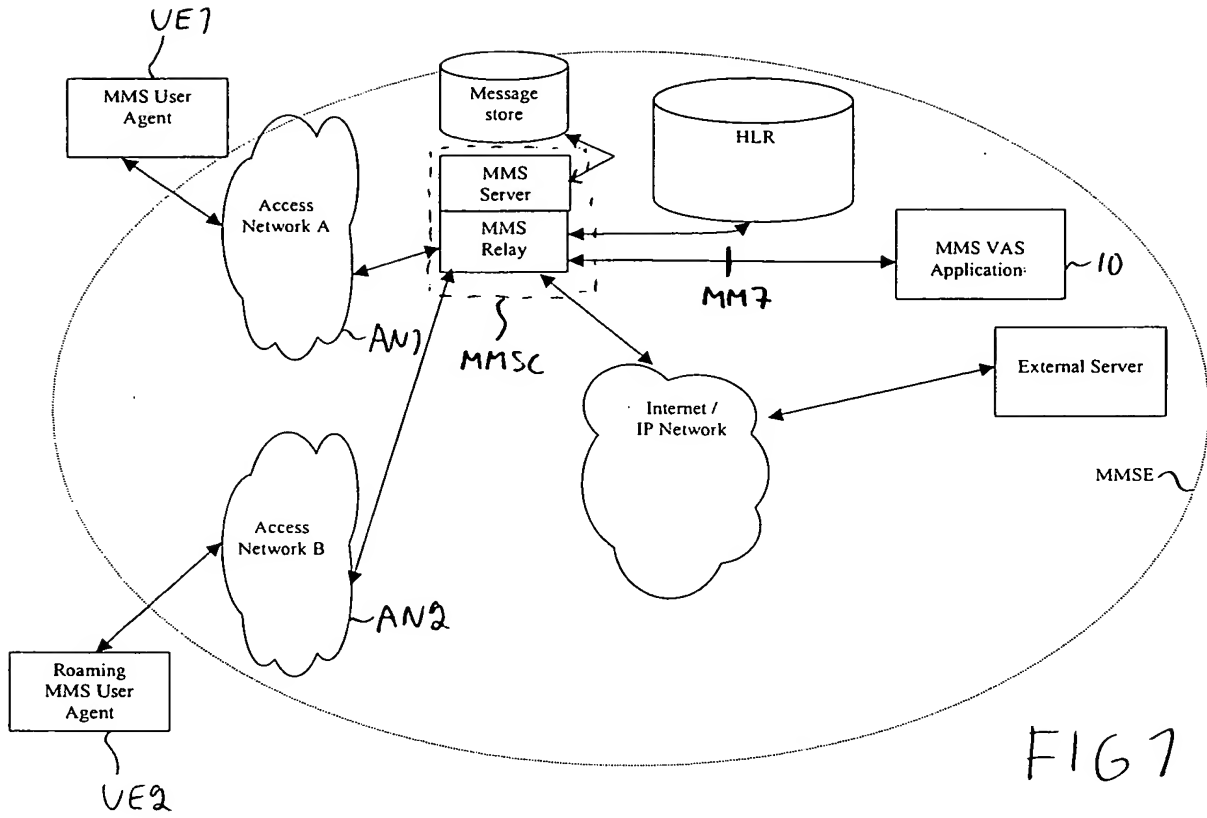


FIG 1

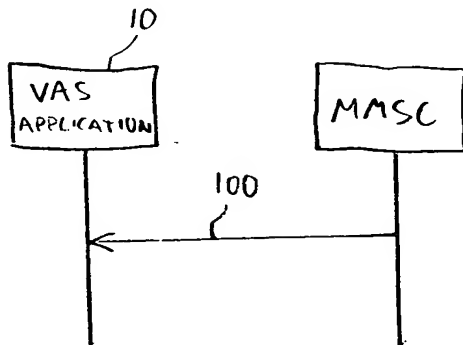


FIG 2

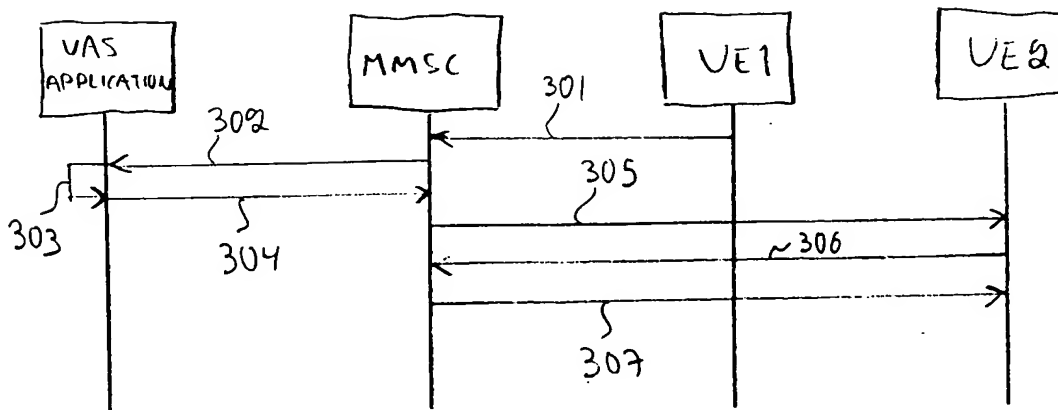


FIG 3